IN THE CLAIMS

The claims pending in the application are reproduced below in accordance with 37 C.F.R. § 1.121:

1. (currently amended) A cooling apparatus for fuel cell components comprising:

a base plate having an upper section and a lower section;

a plurality of upper ribs ~~and a plurality of lower ribs~~ coupled to said upper section and a plurality of lower ribs coupled to said lower section, ~~respectively, each of~~ said plurality of upper ribs ~~and lower ribs~~ defining an upper serpentine channel and said lower ribs defining a lower channel parallel to said upper serpentine channel ~~formed between each of said plurality of upper ribs and lower ribs, respectively~~, said upper serpentine channel and said lower channel being fluidically coupled by at least one cavity disposed in said base plate,

wherein said upper serpentine channel and said lower channel are disposed to allow a flow of a fluid therethrough ~~so as to enhance the~~ for heat transfer between said fluid and said fuel cell components.

2. (original) The cooling apparatus of claim 1, wherein said fuel cell components are selected from the group consisting of cathodes, anodes and electrolytes.

3. (currently amended) The cooling apparatus of claim 1, wherein a plurality of concavities are disposed on a surface portion of said upper serpentine channel and disposed on a surface portion of said lower channel so as to cause hydrodynamic interactions and affect the heat transfer rate within ~~between~~ said fuel cell components ~~fluid and said concavities when said fluid is disposed over said concavities~~.

4. (original) The cooling apparatus of claim 3, wherein said concavities are selected from the group consisting of depressions, indentations, dimples and pits.

5. (original) The cooling apparatus of claim 1, wherein said fluid is selected from the group consisting of gaseous fuels and oxidants.

6. (previously presented) The cooling apparatus of claim 1, wherein said cooling apparatus comprises one of a thin-formed metal, stainless steel, cobaltite, ceramic, LaCrO3, CoCrO4, an alloy comprising nickel and chromium, an alloy comprising nickel and cobalt, or combinations thereof.

7. (currently amended) A fuel cell assembly comprising:

a fuel cell electrode and an electrolyte ~~disposed therebetween~~;

a cooling apparatus coupled to said fuel cell electrode ~~at least one of said electrodes~~, said cooling apparatus comprising:

a base plate having an upper section and a lower section;

a plurality of upper ribs ~~and a plurality of lower ribs~~ disposed over said upper section and a plurality of lower ribs disposed over said lower section, ~~respectively, each of~~ said plurality of upper ribs ~~and lower ribs~~ defining an upper serpentine channel and said plurality of lower ribs defining a lower channel ~~formed between each of said plurality of upper ribs and lower ribs, respectively,~~ parallel to said upper serpentine channel, said upper serpentine channel and said lower channel being fluidically coupled by at least one cavity disposed in said base plate,

wherein said upper serpentine channel and said lower channel are disposed to allow a flow of a fluid therethrough ~~so as to enhance the~~ for heat transfer between said fluid and said fuel cell electrode.

8. (previously presented)The fuel cell assembly of claim 7, wherein said fuel cell assembly is selected from the group consisting of solid oxide fuel cells, solid polymer fuel cells, molten carbonate fuel cells, phosphoric acid fuel cells, alkaline fuel cells, direct methanol fuel cells, regenerative fuel cells, and protonic ceramic fuel cells.

9. (currently amended) The fuel cell assembly of claim 7, wherein said fuel cell electrode is selected from the group consisting of a cathode ~~cathodes~~ and an anode ~~anodes~~.

10. (currently amended) The fuel cell assembly of claim 7, wherein a plurality of concavities are disposed on a surface portion of said upper serpentine channel and disposed on a surface portion of said lower channel so as to cause hydrodynamic interactions and affect the heat transfer rate within ~~between~~ said fuel cell assembly ~~fluid and said concavities when said fluid is disposed over said concavities~~.

11. (original) The fuel cell assembly of claim 10, wherein said concavities are selected from the group consisting of depressions, indentations, dimples and pits.

12. (currently amended) The fuel cell assembly of claim 7, wherein a plurality of concavities are disposed on a surface portion of said fuel cell electrode so as to cause hydrodynamic interactions and affect the heat transfer rate ~~between~~ within said fuel cell assembly ~~fluid and said fuel cell electrode when said fluid is disposed over said concavities~~.

13. (original) The fuel cell assembly of claim 7, wherein said fluid is selected from the group consisting of gaseous fuels and oxidants.

14. (previously presented) The fuel cell assembly of claim 7, wherein said cooling apparatus comprises one of a thin-formed metal, stainless steel, cobaltite, ceramic, LaCrO3, CoCrO4, an alloy comprising nickel and chromium, an alloy comprising nickel and cobalt, or combinations thereof.